

REMARKS

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 13, 15, 16, 23, 31, 33, 34, 41, 43 and drawing 9 are amended and claims 53-77 are newly inserted. Also, Fig. 9 of the drawings is amended.

From now on, claims 1-77 are pending, among which claims 1, 13, 23, 31, 33, 34, 40, 41, 47, 48, 52, and 59 are independent claims.

Based on the above amendment and the following Remarks, Applicants respectfully request that the Examiner reconsiders all outstanding objections and rejections and they be withdrawn. Applicants believe that no new matters have been added by this amendment. Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. Furthermore, attached hereto is a clean version of supplemental claims incorporating changes made by the current Amendment, for the Examiner's convenience.

Rejections Under 35 U.S.C. § 103

On page 2-5 of the Office Action, the Examiner rejected claims 1,4-12,17-22,27,30,35-40 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,473,455 issued to Koike et al ("Koike") in view of U.S. Patent No. 5,608,556 issued to Koma ("Koma"). The Examiner further rejected claims 2-3 under 35 U.S.C. 103(a) as being unpatentable over Koike in view of Koma and further in view of U.S. Patent No. 6,141,074 Bos et al. ("Bos"). Applicants respectfully disagree with the Examiner's rejection.

Claim 1 of the present Application recites a liquid crystal display, comprising a plurality of protrusions formed on the common electrode and a pixel electrode having a plurality of apertures formed on the second substrate.

To establish a *prima facie* case of obviousness for a given claim, two requirements must be satisfied. First, the cited requirements must teach or suggest all the features recited in the claim. Second, there must have been some teaching or suggestion in existence at the time the invention was made that would have led on of ordinary skill in the art to combine the references in an attempt to form the claimed invention. Applicants respectfully submit that neither reference, taken individually or in combination, meets these requirements.

The Examiner's reliance on the combination of Koike in view of Koma is misplaced, because neither Koike nor Koma suggests combining the two references to form the claimed invention.

In Koike, Figs. 50 and 51 show the domains A and B defined by a protrusion 26p and depression 22d. **The Liquid Crystal 20 controlling power generated by a protrusion 26p and depression 22d to define the domains is just based on the geometric structure like a protrusion and a depression.** In col. 20, lines 32-43 of Koike, Koike explains such concept as follows: "[T]he Liquid Crystal 20 **has a tendency to align depending on the surface shape of a structure that the Liquid Crystal 20 contacts.** Accordingly, as shown in FIG. 50, molecules of the liquid crystal 20 located near the respective glass plate 16 and 18 at the corners of the portions 22d and 26p are aligned obliquely to the corners of the portions 22d and 26p and this alignment coincides with the alignment caused by the rubbing directions. Accordingly, the portions 22d and 26p of the alignment layers 22 and 26 help the alignment of the liquid crystal 20 to improve the behavior of the liquid crystal 20 at the boundary between the liquid crystal

aligning domains A and B.” In other words, the Liquid Crystal molecules shown in Koike are controlled by only geometric structures.

In Koma, the LCD shown in Fig. 8 discloses an aperture 33b and a liquid crystal orientation control electrode 22 to divide a pixel into multi-domains. The Liquid Crystal 40 is controlled through the power generated by an aperture 33b and a liquid crystal orientation control electrode 22 to define the domains. The Liquid Crystal 40 is controlled just **based on the electric field**. As shown in Figs. 5 and 9, Koma discloses the multi-domains only defined by the direction of the electric field 42 generated by an aperture and an orientation control electrode. **Koma does not disclose any geometric structure** to provide the Liquid Crystal controlling power.

Therefore, neither of the cited references teaches combination of control of geometric structures and control by electric field.

In the present invention, however, the LCD shown in Fig. 5 as one of embodiment discloses an electrode aperture 270 and a protrusion 170 formed on substrates. The Liquid Crystal 30 controlling power generated **by a electrode aperture 270 and protrusions 170** to define the domains is **based on the electric fringe field caused by the electrode aperture as well as the geometric structure caused by the protrusions**.

In forming multi-domains to provide wide viewing angle of LCD, an electric fringe field method is quite different from using a geometric structure. It is not obvious to combine the two different technologies, as the Examiner alleges. To control the liquid crystal, Koma simply suggests the electrical fringe field in controlling the liquid crystal. Koike suggests the geometric structure. Neither Koma nor Koike suggests to combine the two methods. The Examiner failed

to provide any evidence of obviousness in combining these two references. Therefore, it is not obvious for one of ordinary skill in the art to conceive a combination of cited references.

Thus, claim 1 is patentable over the references of record.

Likewise, Claims 2-12, 17-22, 27, 30 and 35-39 that are dependent from claim 1 are also patentable over the references of record.

The Examiner rejected claims 40, 47, and 48 for the same reason. However, each of these claims recites the limitation of comprising a protrusion and an aperture. Therefore, for the same reason as we discussed previously, those independent claims 40, 47 and 48 are all patentable over the references of record. Likewise, claims 44-46 and 49-51 that are respectively dependent from claims 40 and 48 are also patentable over the references of records.

Therefore, Applicants respectfully request that all the outstanding rejections and objections over claims 1-12, 17-22, 27, 30, 35-40 and 44-51 be withdrawn and pass the present pending claims to allowance.

Allowable subject matter

On page 5 of the Office Action, the examiner said that claims 13-16, 23-26, 28-29, 31-34 and 41-43 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

By this amendment, claims 13, 23, 31, 33, 34 and 41 are rewritten in independent form including all of the limitations of the base claim and any intervening claims. The other claims depend on the above independent claim.

Therefore, it is respectfully requested that claims 13-16, 23-26, 28-29, 31-34 and 41-43 be passed to allowance.

Other issues

In this amendment, Applicants add new claims 52-77, among which claims 52 and 59 are independent claims.

Claim 52 discloses a first protrusion **having a branch** extending along an edge of the first electrode. Claim 59 discloses a first protrusions and a second protrusions which **meet each other** or the imaginary extension of the first protrusions and the second protrusions **meet each other**.

Applicants believe that none of the cited references of the record in the Office Action disclose each and every element of the claims newly added.

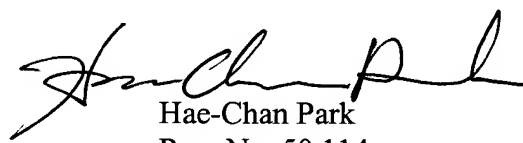
Therefore, it is respectfully requested that new claims 52-77 are patentable over the cited references of the record.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete response has been made to the outstanding Office Action and, as such, claims 1-77 are in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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Attachment: DRAWING CORRECTION UNDER 37 C.F.R. §1.12